



ON Semiconductor®

## FGD2736G3-F085

### EcoSPARK™ 3 270mJ, 360V, N-Channel Ignition IGBT

#### Features

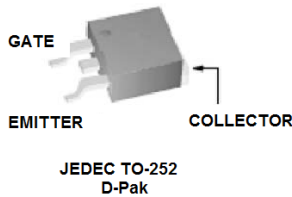
- SCIS Energy = 270mJ at  $T_J = 25^\circ\text{C}$
- SCIS Energy = 170mJ at  $T_J = 150^\circ\text{C}$
- Logic Level Gate Drive
- RoHS Compliant



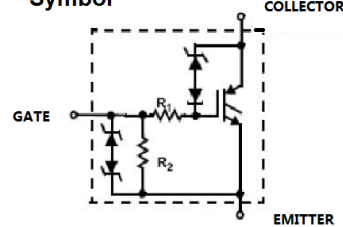
#### Applications

- Automotive Ignition Coil Driver Circuits
- Coil On Plug Applications

#### Package



#### Symbol



#### Absolute Maximum Ratings $T_A = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Ratings	Units
$BV_{CER}$	Collector to Emitter Breakdown Voltage ( $I_C = 1\text{mA}$ )		360	V
$BV_{ECS}$	Emitter to Collector Voltage - Reverse Battery Condition ( $I_C = 10\text{mA}$ )		28	V
$ESCIS_{25}$	$I_{SCIS} = 13.4\text{A}$ , $L = 3.0\text{mH}$ , $R_{GE} = 1\text{K}\Omega$	$T_C = 25^\circ\text{C}$	270	mJ
$ESCIS_{150}$	$I_{SCIS} = 10.8\text{A}$ , $L = 3.0\text{mH}$ , $R_{GE} = 1\text{K}\Omega$	$T_C = 150^\circ\text{C}$	170	mJ
$I_{C25}$	Collector Current Continuous, at $T_C = 25^\circ\text{C}$ , $V_{GE} = 5.0\text{V}$		21	A
$I_{C110}$	Collector Current Continuous, at $T_C = 110^\circ\text{C}$ , $V_{GE} = 5.0\text{V}$		18	A
$V_{GEM}$	Gate to Emitter Voltage Continuous		$\pm 10$	V
$P_D$	Power Dissipation Total	$T_C = 25^\circ\text{C}$	150	W
	Power Dissipation Derating	$T_C > 25^\circ\text{C}$	1	W/ $^\circ\text{C}$
$T_J$	Operating Junction Temperature Range		-40 to +175	$^\circ\text{C}$
$T_{STG}$	Storage Junction Temperature Range		-40 to +175	$^\circ\text{C}$
$T_L$	Max. Lead Temp. for Soldering (Leads at 1.6mm from case for 10s)		300	$^\circ\text{C}$
$T_{PKG}$	Max Lead Temp for soldering (Package Body for 10s)		260	$^\circ\text{C}$
ESD	Electrostatic Discharge Voltage at 100pF, 1500Ω		4	kV

FGD2736G3-F085 EcoSPARK™ 270mJ, 360V, N-Channel Ignition IGBT

**Thermal Characteristics**

$R_{\theta JC}$	Thermal Resistance Junction to Case	1	°C/W
-----------------	-------------------------------------	---	------

**Electrical Characteristics of the IGBT**  $T_A = 25^\circ\text{C}$  unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
--------	-----------	-----------------	-----	-----	-----	-------

**Off Characteristics**

$BV_{CER}$	Collector to Emitter Breakdown Voltage	$V_{GE} = 0V, I_{CE} = 2mA,$ $R_{GE} = 1K\Omega,$ $T_J = -40 \text{ to } 150^\circ\text{C}$	330	-	390	V	
$BV_{CES}$	Collector to Emitter Breakdown Voltage	$V_{GE} = 0V, I_{CE} = 10mA,$ $R_{GE} = 0\Omega,$ $T_J = -40 \text{ to } 150^\circ\text{C}$	350	-	410	V	
$BV_{ECS}$	Emitter to Collector Breakdown Voltage	$V_{GE} = 0V, I_{CE} = -75mA,$ $T_J = 25^\circ\text{C}$	28	-	-	V	
$BV_{GES}$	Gate to Emitter Breakdown Voltage	$I_{GES} = \pm 5mA$	$\pm 11$	$\pm 14$	-	V	
$I_{CER}$	Collector to Emitter Leakage Current	$V_{CE} = 250V, R_{GE} = 1K\Omega$	$T_J = 25^\circ\text{C}$	-	-	25	$\mu\text{A}$
			$T_J = 150^\circ\text{C}$	-	-	1	mA
$I_{ECS}$	Emitter to Collector Leakage Current	$V_{EC} = 24V$	$T_J = 25^\circ\text{C}$	-	-	1	mA
			$T_J = 150^\circ\text{C}$	-	-	40	
$R_1$	Series Gate Resistance		-	110	-	$\Omega$	
$R_2$	Gate to Emitter Resistance		10K	-	30K	$\Omega$	

**On Characteristics**

$V_{CE(SAT)}$	Collector to Emitter Saturation Voltage	$V_{GE} = 4V, I_{CE} = 6A$	$T_J = 25^\circ\text{C}$	-	1.25	1.35	V
$V_{CE(SAT)}$	Collector to Emitter Saturation Voltage	$V_{GE} = 4.5V, I_{CE} = 10A$	$T_J = 25^\circ\text{C}$	-	1.45	1.65	V
$V_{CE(SAT)}$	Collector to Emitter Saturation Voltage		$T_J = 150^\circ\text{C}$		1.6	1.8	V

**Dynamic Characteristics**

$Q_{G(ON)}$	Gate Charge	$V_{GE} = 5V, V_{CE} = 12V, I_{CE} = 10A$	-	18	-	nC	
$V_{GE(TH)}$	Gate to Emitter Threshold Voltage	$I_{CE} = 1mA, V_{CE} = V_{GE},$	$T_J = 25^\circ\text{C}$	1.3	1.6	2.2	V
			$T_J = 150^\circ\text{C}$	0.75	1.1	1.8	
$V_{GEP}$	Gate to Emitter Plateau Voltage	$V_{CE} = 12V, I_{CE} = 10A$	-	3.0	-	V	

**Switching Characteristics**

$t_{d(ON)R}$	Current Turn-On Delay Time-Resistive	$V_{CE} = 14V, R_L = 1\Omega$	-	0.9	4	$\mu\text{s}$
$t_{rR}$	Current Rise Time-Resistive	$V_{GE} = 5V, R_G = 1K\Omega$	-	3	7	$\mu\text{s}$
$t_{d(OFF)L}$	Current Turn-Off Delay Time-Inductive	$V_{CE} = 300V, L = 2mH,$	-	4.4	15	$\mu\text{s}$
$t_{fL}$	Current Fall Time-Inductive	$V_{GE} = 5V, R_G = 1K\Omega$	-	1.9	15	$\mu\text{s}$

**Ordering Information**

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FGD2736G3	FGD2736G3-F085	TO-252AA	330mm	16mm	2500units

## Typical Performance Curves

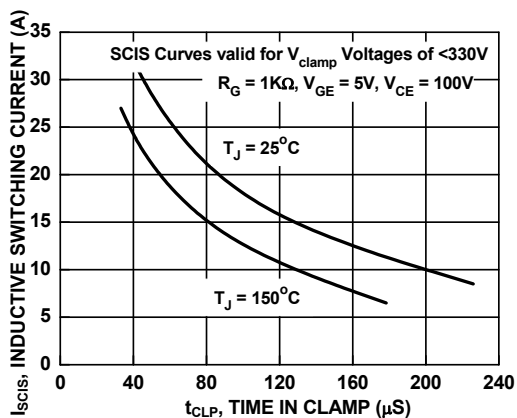


Figure 1. Self Clamped Inductive Switching Current vs. Time in Clamp

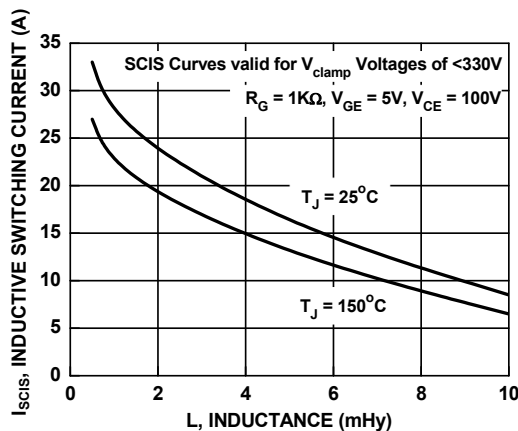


Figure 2. Self Clamped Inductive Switching Current vs. Inductance

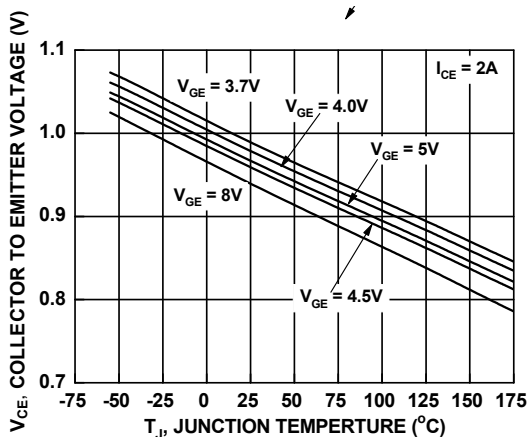


Figure 3. Collector to Emitter On-State Voltage vs. Junction Temperature

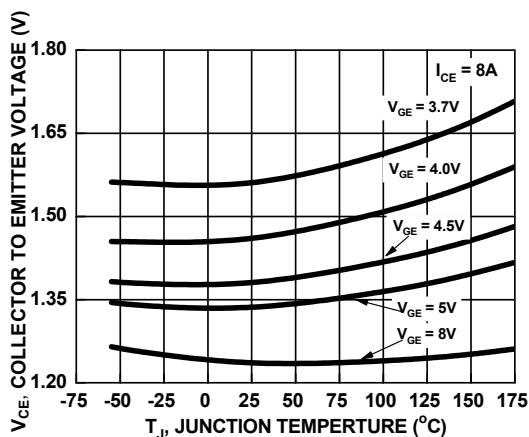


Figure 4. Collector to Emitter On-State Voltage vs. Junction Temperature

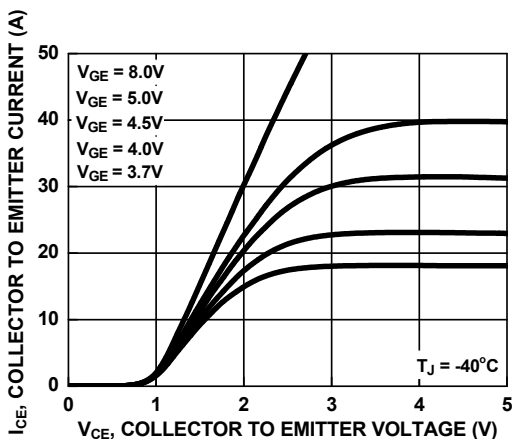


Figure 5. Collector to Emitter On-State Voltage vs. Collector Current

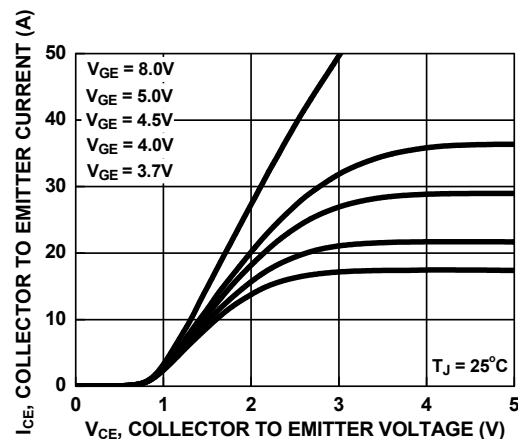


Figure 6. Collector to Emitter On-State Voltage vs. Collector Current

Typical Performance Curves (Continued)

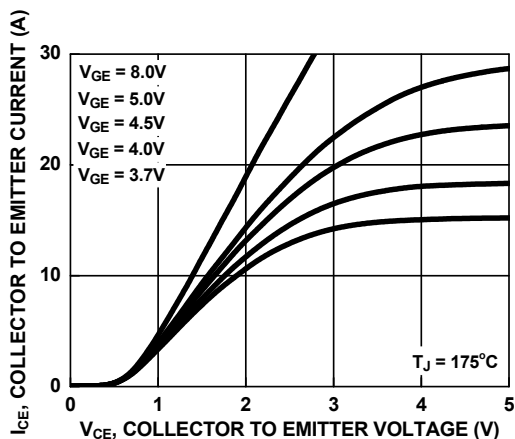


Figure 7. Collector to Emitter On-State Voltage vs. Collector Current

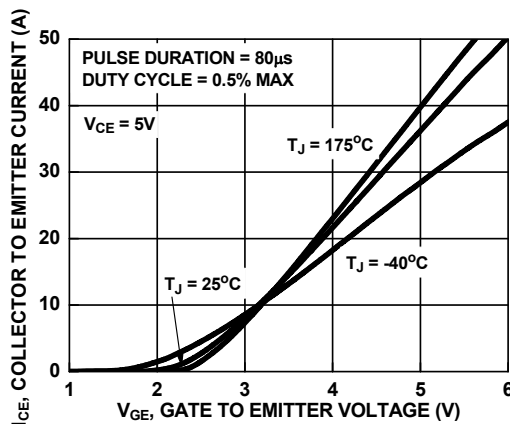


Figure 8. Transfer Characteristics

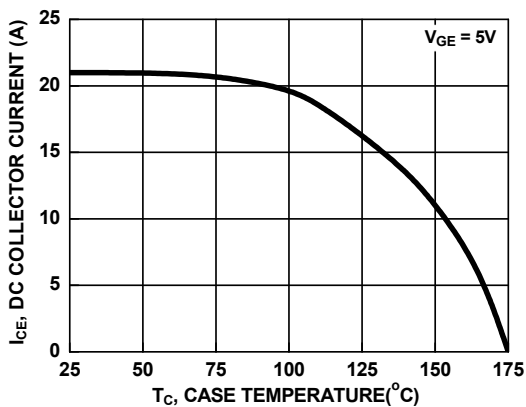


Figure 9. DC Collector Current vs. Case Temperature

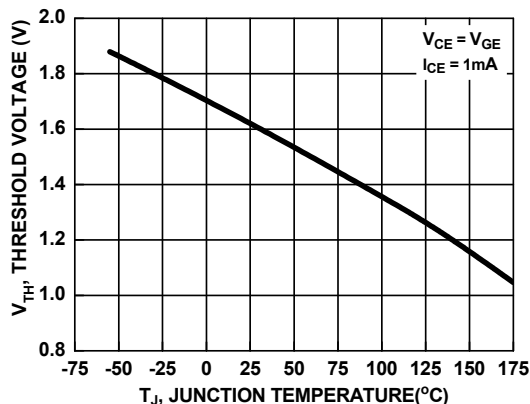


Figure 10. Threshold Voltage vs. Junction Temperature

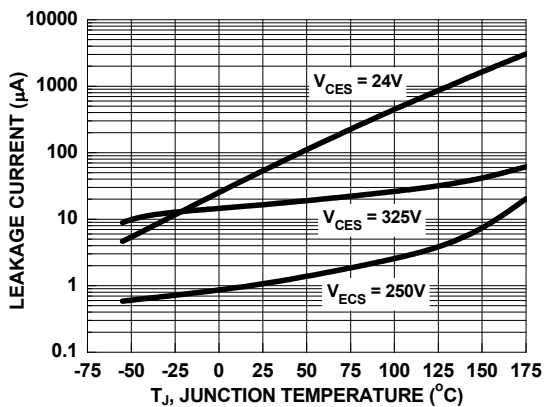


Figure 11. Leakage Current vs. Junction Temperature

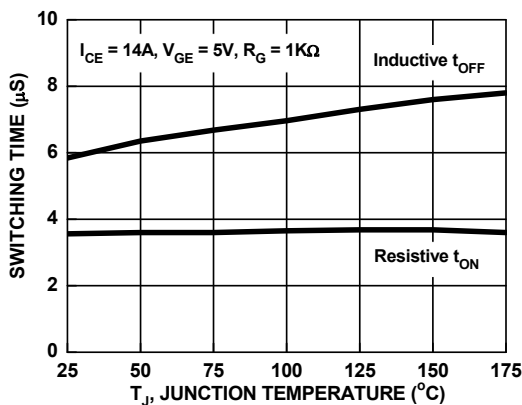


Figure 12. Switching Time vs. Junction Temperature

Typical Performance Curves (Continued)

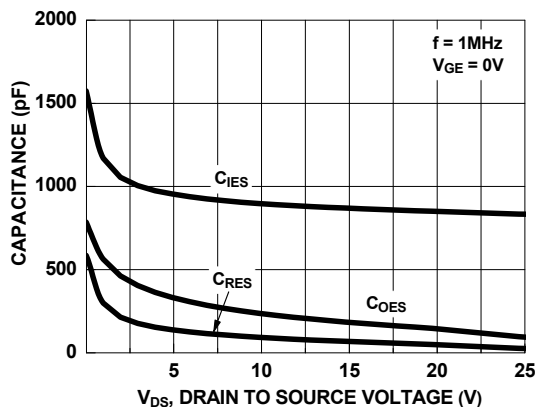


Figure 13. Capacitance vs. Collector to Emitter Voltage

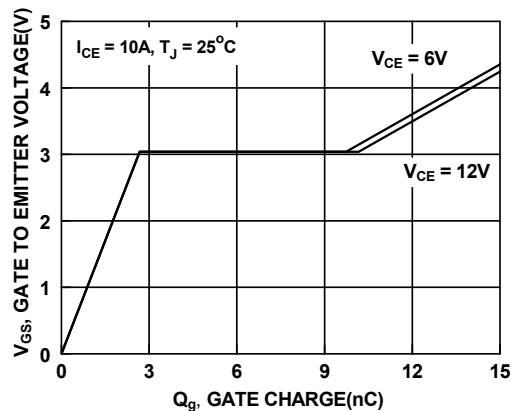


Figure 14. Gate Charge

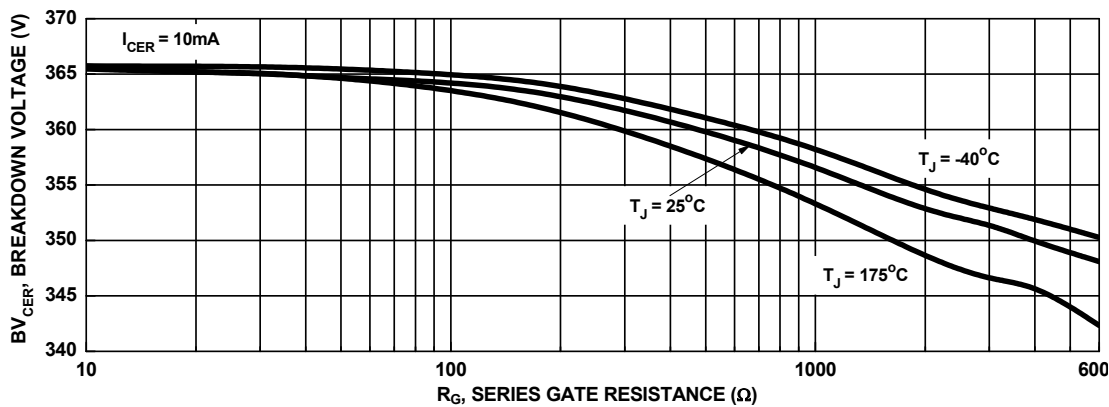


Figure 15. Break down Voltage vs. Series Gate Resistance

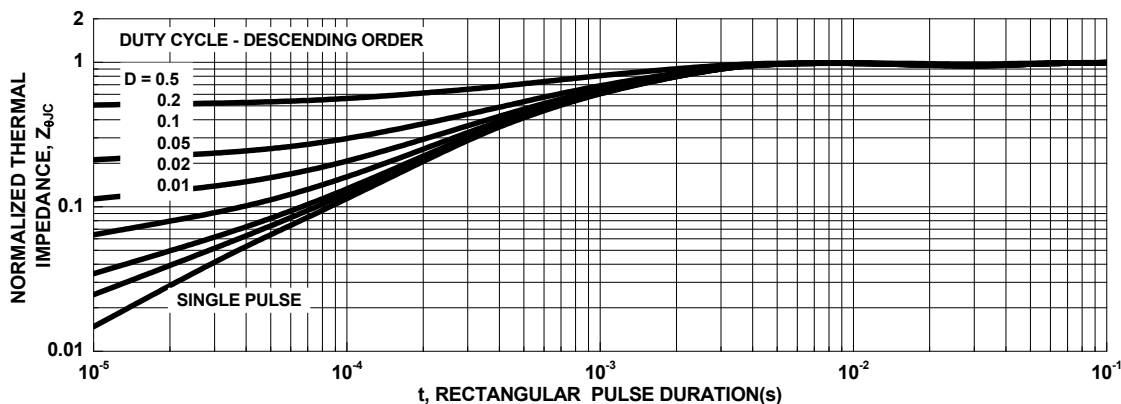


Figure 16. IGBT Normalized Transient Thermal Impedance, Junction to Case

## Typical Performance Curves

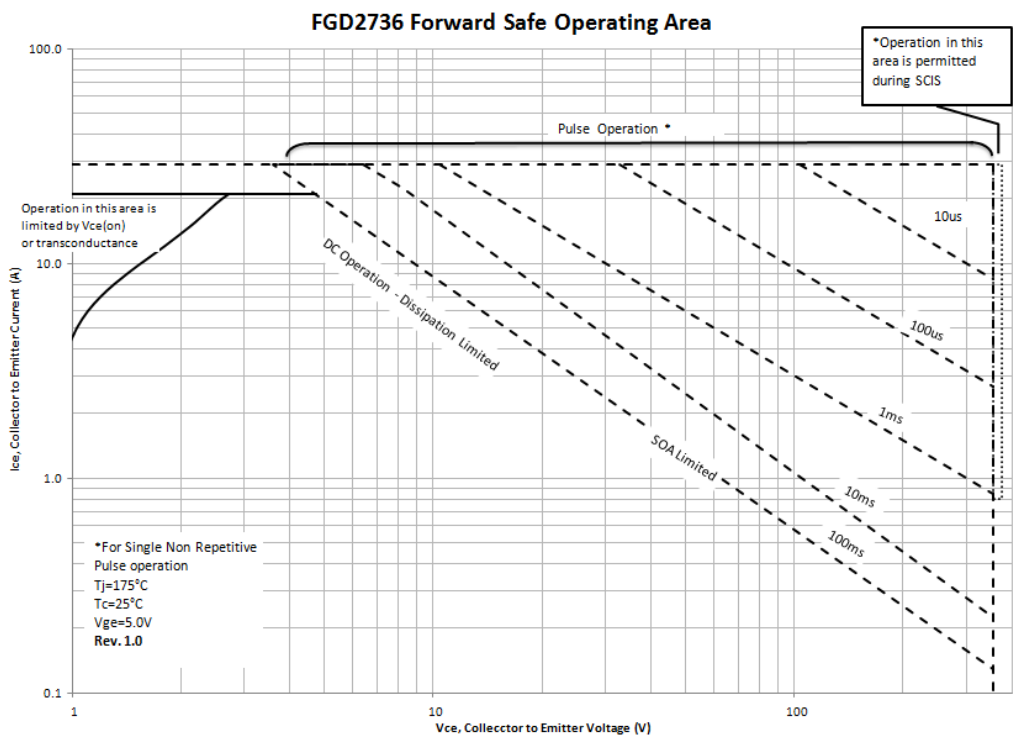
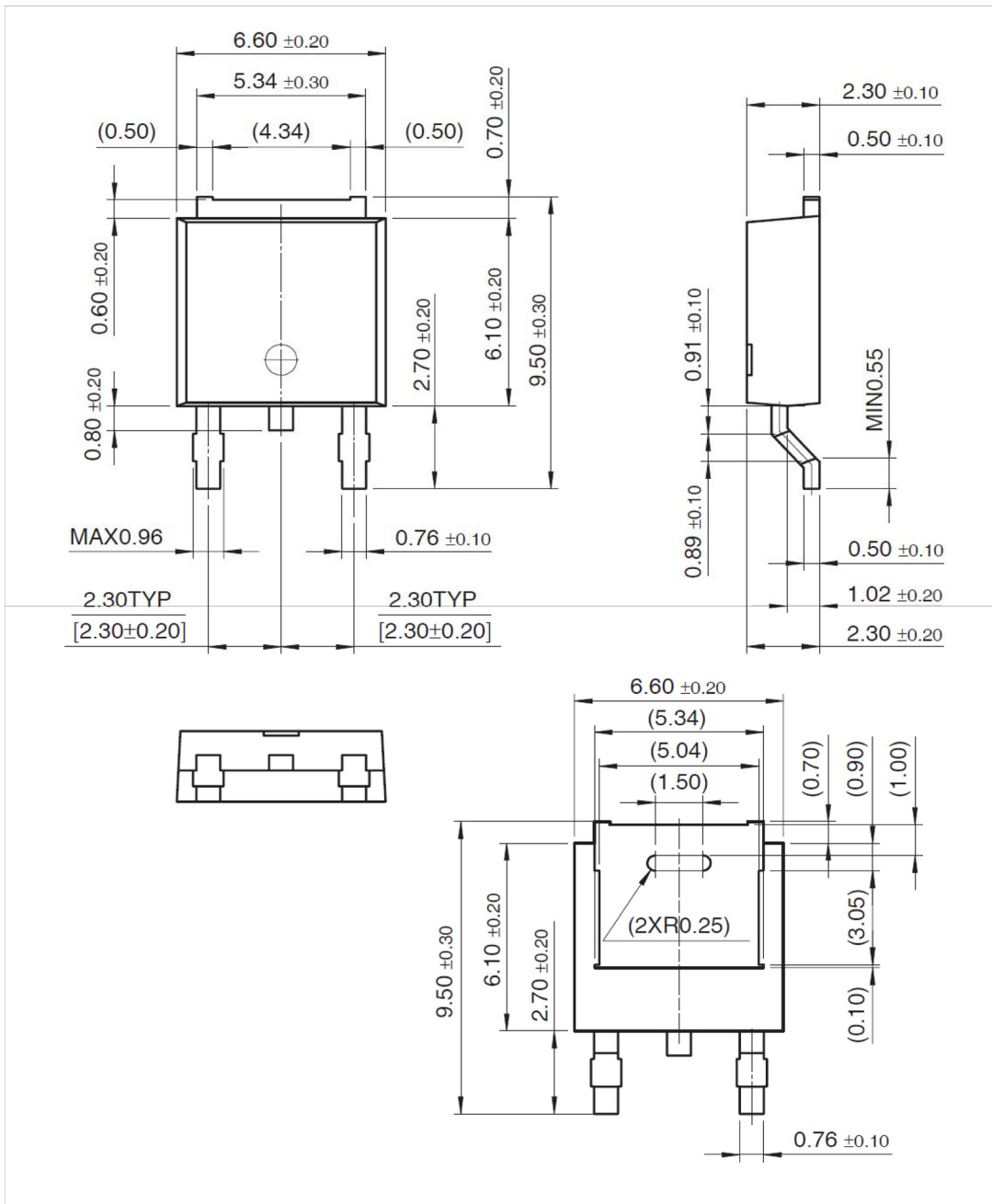


Figure 17. Forward Safe Operating Area

## Physical Dimensions



ON Semiconductor and  are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of ON Semiconductor's product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using ON Semiconductor products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by ON Semiconductor. "Typical" parameters which may be provided in ON Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. ON Semiconductor does not convey any license under its patent rights nor the rights of others. ON Semiconductor products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use ON Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold ON Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that ON Semiconductor was negligent regarding the design or manufacture of the part. ON Semiconductor is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

## PUBLICATION ORDERING INFORMATION

### LITERATURE FULFILLMENT:

Literature Distribution Center for ON Semiconductor  
19521 E. 32nd Pkwy, Aurora, Colorado 80011 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** [orderlit@onsemi.com](mailto:orderlit@onsemi.com)

**N. American Technical Support:** 800-282-9855 Toll Free  
USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5817-1050

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>  
For additional information, please contact your local  
Sales Representative





## Стандарт Электрон Связь

Мы молодая и активно развивающаяся компания в области поставок электронных компонентов. Мы поставляем электронные компоненты отечественного и импортного производства напрямую от производителей и с крупнейших складов мира.

Благодаря сотрудничеству с мировыми поставщиками мы осуществляем комплексные и плановые поставки широчайшего спектра электронных компонентов.

Собственная эффективная логистика и склад в обеспечивает надежную поставку продукции в точно указанные сроки по всей России.

Мы осуществляем техническую поддержку нашим клиентам и предпродажную проверку качества продукции. На все поставляемые продукты мы предоставляем гарантию .

Осуществляем поставки продукции под контролем ВП МО РФ на предприятия военно-промышленного комплекса России , а также работаем в рамках 275 ФЗ с открытием отдельных счетов в уполномоченном банке. Система менеджмента качества компании соответствует требованиям ГОСТ ISO 9001.

Минимальные сроки поставки, гибкие цены, неограниченный ассортимент и индивидуальный подход к клиентам являются основой для выстраивания долгосрочного и эффективного сотрудничества с предприятиями радиоэлектронной промышленности, предприятиями ВПК и научно-исследовательскими институтами России.

С нами вы становитесь еще успешнее!

### Наши контакты:

**Телефон:** +7 812 627 14 35

**Электронная почта:** [sales@st-electron.ru](mailto:sales@st-electron.ru)

**Адрес:** 198099, Санкт-Петербург,  
Промышленная ул, дом № 19, литера Н,  
помещение 100-Н Офис 331